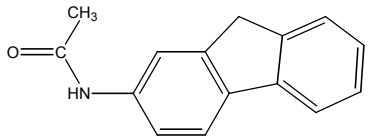
2-ACETYLAMINOFLUORENE
CAS No. 53-96-3
First Listed in the *Second Annual Report on Carcinogens*



CARCINOGENICITY

2-Acetylaminofluorene is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals. When incorporated in the diet, 2-acetylaminofluorene induced increased incidences of carcinomas of the urinary bladder and subcutaneous carcinomas on the face (possibly arising from the auditory canal) in rats of both sexes (Wilson et al., 1941). The same route of administration of 2-acetylaminofluorene in another study induced increased incidences of carcinomas of the liver and urinary bladder in mice of both sexes (Staffa and Mehlman, 1980).

In a separate study, incorporation in the diet induced a high incidence of hepatocellular carcinomas, testicular mesotheliomas, and Zymbal gland tumors in rats (Cabral and Neal, 1983). Because of the potency of this compound and its known carcinogenic action, it is used extensively as a positive control for assaying other compounds for carcinogenicity. NTP and IARC have not reviewed 2-acetylaminofluorene for evidence of its carcinogenicity in experimental animals.

There are no data to evaluate the carcinogenicity of 2-acetylaminofluorene in humans.

PROPERTIES

2-Acetylaminofluorene occurs as light tan crystalline needles. It is insoluble in water and soluble in alcohols, glycols, ether, acetic acid, and fat solvents. 2-Acetylaminofluorene is available as a grade that is 95 to 98% pure. When heated to decomposition, it emits toxic fumes of nitrogen oxides (NO_x).

USE

2-Acetylaminofluorene is used as a positive control by toxicologists to study the carcinogenicity and mutagenicity of aromatic amines. 2-Acetylaminofluorene was intended for use as a pesticide but was never marketed because of its carcinogenicity in experimental animals (Sittig, 1985).

PRODUCTION

2-Acetylaminofluorene is not currently produced domestically. Instead, it is imported and distributed by several specialty chemical companies (HSDB, 1997). The 1998 *Chemical Buyers Directory* lists one U.S. supplier of the compound (Tilton, 1997). A typical distributor stocks about 9 lb of 2-acetylaminofluorene and usually sells it in 1-, 5-, or 25-g quantities. Total

estimated U.S. usage is therefore less than 20 lb per year (Sittig, 1985). The 1979 TSCA Inventory reported one producer but no production volume in 1977 (TSCA, 1979).

EXPOSURE

The primary routes of potential human exposure to 2-acetylaminofluorene are inhalation and dermal contact. Chemists, chemical stockroom workers, and biomedical researchers have the greatest risk of occupational exposure to 2-acetylaminofluorene. The National Occupational Exposure Survey (1981-1983) indicated that 896 total workers, including 299 women, potentially were exposed to 2-acetylaminofluorene in the workplace (NIOSH, 1984). For the general population, exposure will most likely be minimal, since its release to the environment from artificial sources is probably not significant; less than 20 lb per year are consumed in the United States (HSDB, 1997).

REGULATIONS

EPA regulates 2-acetylaminofluorene under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act (TSCA). 2-Acetylaminofluorene has been designated as a hazardous constituent of waste and a potential human carcinogen under RCRA. Based on this designation, a reportable quantity (RQ) of 1 lb has been established under CERCLA. 2-Acetylaminofluorene is subject to reporting requirements under SARA. Specific categories of stationary sources that emit (or have potential to emit) 2-acetylaminofluorene are also regulated by EPA under the Clean Air Act (CAA). NIOSH recommends that occupational exposure to 2-acetylaminofluorene be limited to the lowest feasible concentration (NIOSHc, 1994). OSHA has promulgated a standard designating protective clothing and hygiene procedures for anyone handling, storing, or working with 2-acetylaminofluorene, and special engineering requirements for its manufacture and processing. OSHA regulates 2-acetylaminofluorene under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-2.